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PICO MACOM®

MPC-12R

Universal Chassis and Hot-Swappable Redundant Power Supply

Installation and Operation Manual

PICO MACOM®
A STEREN COMPANY

Ph:800-421-6511 *www.picomacom.com*

Operation
Manual
Rev. 07/06

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MPC-12R

Product Inspection

Inspect the equipment for shipping damage. Should any damage be discovered, immediately file a claim with the carrier.

Important Safety Instructions

To insure proper installation and operation, take a moment to read this guide before proceeding with the installation. If you have any questions or comments about the **MPC-12R** universal chassis, please contact your dealer or have him contact the **PICO MACOM** Service Center at this phone number: 800-421-6511.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of un-insulated “dangerous voltage” within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING: **TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE. DO NOT OPEN THE CABINET. REFER SERVICING TO QUALIFIED PERSONNEL ONLY.**

CAUTION: **TO PREVENT ELECTRIC SHOCK DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.**

ATTENCION: **POUR PREVENIR LES CHOCS ELECTRIQUES, NE PAS UTILISER CETTE FICHE POLARISEE AVEC UN PROLONGATEUR, UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ETRE INSEREES A FOND SANS EN LAISSER AUCUNE PARTIE A DECOUVERT.**

1. **Read Instructions:** All safety and operating instructions should be read before the appliance is operated.

2. Retain Instructions: The safety and operating instructions should be retained for future reference.

3. Heed Warnings: All warnings on the appliance should be adhered to.

4. Follow Instructions: All operating and user instructions should be followed.

5. Cleaning: Unplug this appliance from the wall outlet before cleaning. Use a damp cloth for cleaning. Do not use liquid cleaners or aerosol cleansers.

6. Do Not Use Attachments: Use of attachments not recommended by the manufacturer may cause hazards.

7. Water and Moisture: Do not use this product near water—for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool—and the like.

8. **Accessories:** Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the appliance.

9. Ventilation: This video product should never be placed near or over a radiator or heat register. This video product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer’s instructions have been adhered to. Any slots or opening in the cabinet are provided for ventilation. To ensure reliable operation of the video product and to protect it from overheating, these openings must not be blocked or covered. Openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface.

10. Grounding or Polarization: This video product is equipped with either a three prong plug for 110 VAC use or a two prong flat blade 220 volt type plug. Each type is to be inserted into only the type of receptacle for which they specifically designed. Do not cut off the round grounding pin in order to be able to fit into a two prong receptacle as this could cause injury and will void the warranty.

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11. Power Sources: This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supplied to your home, consult your appliance dealer or local power company.

12. Power-cord Protection: Power-supply cords should be routed so they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to cords and plugs, convenience receptacles, and the point where they exit from the appliance.

13. Lightning: For added protection for this product during a lightning storm, or when it is left unattended or unused for long periods of time, the unit should be disconnected from power source.

14. Power Lines: An outside antenna system should not be located in the vicinity of overhead power lines, other electric light or power circuits, where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them may be fatal.

15. Overloading: Do not overload wall outlets and extension cords as this can result in risk of fire or electric shock.

16. Object and Liquid Entry: Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.

17. Servicing: Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

18. Damage Requiring Service: Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

a. When the power-supply cord or plug is damaged.

b. If liquid has been spilled, or objects have fallen into the product.

c. If the product has been exposed to rain or water.

d. If the product does not operate normally by following the operating instruction. Adjust only those controls that are covered by the operating instructions. An improper adjustment may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.

e. If the product has been dropped or the cabinet has been damaged.

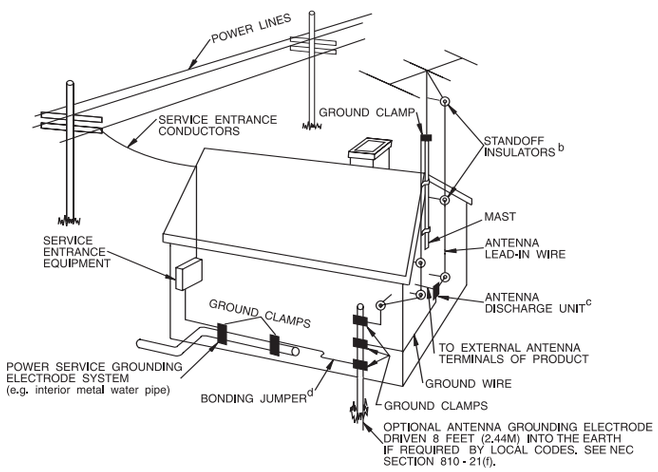
f. When the product exhibits a distinct change in performance—this indicates a need for service.

19. Replacement Parts: When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original parts. Unauthorized substitutes may result in fire, electric shock or other hazards.

20. Safety Check: Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating conditions.

21. Outdoor Antenna Grounding: Before attempting to install this product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges.

EXAMPLE OF ANTENNA GROUNDING ACCORDING TO NATIONAL ELECTRICAL CODE INSTRUCTIONS CONTAINED IN ARTICLE 810 - "RADIO AND TELEVISION EQUIPMENT"


POWER LINES
SERVICE ENTRANCE CONDUCTORS
GROUND CLAMP
STANDOFF INSULATORS b
MAST
ANTENNA LEAD-IN WIRE
SERVICE ENTRANCE EQUIPMENT
ANTENNA DISCHARGE UNIT c
GROUND CLAMPS
TO EXTERNAL ANTENNA TERMINALS OF PRODUCT
POWER SERVICE GROUNDING ELECTRODE SYSTEM (e.g. interior metal water pipe)
GROUND WIRE
BONDING JUMPER d
GROUND CLAMPS
OPTIONAL ANTENNA GROUNDING ELECTRODE DRIVEN 8 FEET (2.44M) INTO THE EARTH IF REQUIRED BY LOCAL CODES. SEE NEC SECTION 810 - 21(f).

a. Use No.10 AWG (5.3mm) copper, No.8 AWG (8.4mm) aluminum, No.7 AWG (10mm) copper-clad steel or bronze wire or larger, as ground wire.

b. Secure antenna lead-in and ground wires to house with standoff insulators spaced from 4 feet (1.22m) to 6 feet (1.83m) apart.

c. Mount antenna discharge unit as close as possible to where lead-in enters house.

d. A driven rod may be used as the grounding electrode where other types of electrode systems do not exist. Refer to the National Electrical Code, ANSI/NFPA 70-1984 for information.

e. Use jumper wire not smaller than No.6 AWG (13.3mm) copper or equivalent, when a separate antenna grounding electrode is used.

NOTE TO THE CATV SYSTEM INSTALLER

THIS REMINDER IS PROVIDED TO CALL THE CATV SYSTEM INSTALLER'S ATTENTION TO ARTICLE 820-22 OF THE NEC THAT PROVIDES GUIDELINES FOR PROPER GROUNDING AND, IN PARTICULAR, SPECIFIES THAT THE CABLE GROUND SHALL BE CONNECTED TO THE GROUNDING SYSTEM OF THE BUILDING, AS CLOSE TO THE POINT OF CABLE ENTRY AS PRACTICAL.

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PICO MACOM®

MPC-12R

Universal Chassis and Hot-Swappable Redundant Power Supply

- ***State-of-the-Art full module N+1 redundancy ensures dual supply operation enabling hot insertion or removal of either power supply module without system disruption and guaranteeing zero down time***
- ***Current sharing, redundant design, and cooling fan provides much less current load per supply ensuring cooler operation thereby substantially improving their long-term reliability***
- ***High efficiency supplies (over 75%) minimize power consumption and heat dissipation***
- ***High isolation O Ring blocking diodes provide unit-to-unit short circuit protection and isolation from hot-swap interaction by preventing power bus disturbance***
- ***Internal fusing circuitry provides current overload protection and precise voltage regulation thereby preventing component damage***
- ***Universal and fully compatible with Pico Macom SAW filtered plug-in modulators, demodulators, and power supply modules, and those of most other manufacturers***
- ***Precision engineered chassis enables smooth insertion or removal of modules along slide guides***
- ***Dedicated home-run individual power connections facilitate removal of modules without disabling the system***
- ***Front panel display provides quick and easy system monitoring and troubleshooting reference***

MPC-12R

Universal Chassis and Hot-Swappable Redundant Power Supply

Pico Macom's MPC-12R is a 2RU (3½″ high) state-of-the-art 19″ rack-mountable chassis equipped with fan-cooled **HOT-SWAPPABLE REDUNDANT** power supply modules. The power supply system (4-module wide) consists of a pair of ultra compact 78-Watt multiple output modules specifically designed for mini-mod applications that require ultra-reliable DC input supply. The supplies combine advanced forward converter topology and extensive surface mount technology to achieve excellent power density. Sophisticated packaging and filtering techniques minimize overall system filtering. Current sharing and redundant supply design, equally shares loads between the supplies and minimize the potential for power bus glitches after a power supply has failed, thereby improving the longevity of the power supply.

Capable of housing up to 12 mini modules, the **MPC-12R** chassis is precision engineered to provide smooth insertion and removal of modules within the provided slide guides. The unit employs a universal wire-harness configuration that can accommodate mini modules from **Pico Macom**, including agile modulators and demodulators, and those from many other manufacturers in a mix and match fashion. Installation is easy. Just slide the modulator or demodulator into the racking system and plug in the supplied power supply cable and connector. Precise and automated manufacturing and value engineering ensure unmatched quality, timely delivery and very competitive cost. Custom assembled and fully tested multi-channel systems are also available from **Pico Macom** with the combination of fixed channel and/or agile mini-modulators and demodulators to meet your requirements. **Pico Macom** backs up this product with its industry leading 5-year limited warranty.

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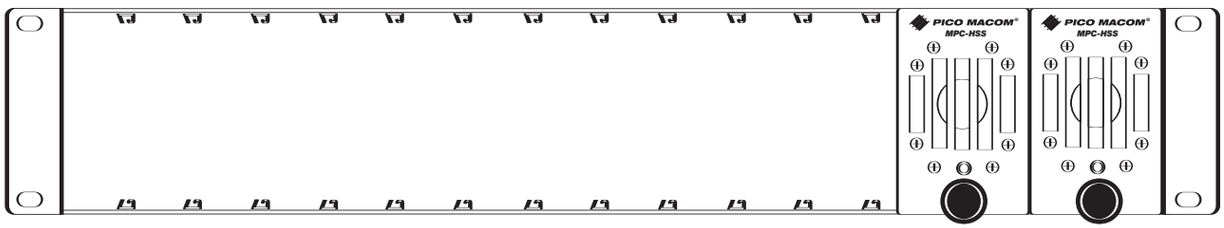
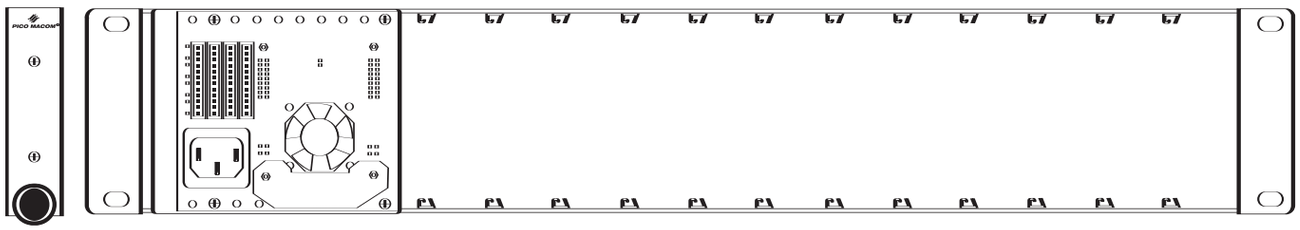
Universal Chassis and Hot-Swappable Redundant Power Supply



Front View



MPC-BP Cover Plate

Rear View

Power Supply

Input Voltage Range:		90 to 264 VAC
Frequency Range:		47 to 63 Hz
Output Specifications:	**V1:**	5 VDC/4 A
	V2:	12 VDC/3.5 A
	V3:	30 VDC/.27 A
Efficiency:		>75% typical
Operating Frequency:		100 kHz
Input Inrush Current:		<30 A @ 115 VAC @ 25° C
Line Protection:		PCB AC line fuse
DC Output Ripple:		Within 1% (Vpp) at maximum load @ 25° C @ PS output terminal
Line/Load Regulation:		±1%
Minimum Load:		10% of full rated load
Operating Temperature Range:		0° to 60° C
Storage Temperature Range:		-40° to 85° C
Overcurrent Protection:		No damage to outputs when shorted to ground

Chassis

Dimensions:	19″(L) x 7 1/2″(D) x 3 1/2″(H)
Weight:	7.8 lbs.

Connectors

Input (on back plane):	IEC 320 inlet connector
Output (on back plane/ each connector):	12 Pin: Pins 1,5,9 - 5 VDC Pins 2,6,10 - 12 VDC Pins 3,7,11 - Ground Pins 4,8,12 - 30 VDC
	4 Pin: Pins 1 - 5 VDC Pins 2 - 12 VDC Pins 3 - Ground Pins 4 - 30 VDC

Ordering Information

MPC-12R	12-Mini-Mod Chassis and Redundant Power Supply System Chassis Equipped with 2-Hot-Swap Modules, Backplane-Bracket, and Wire Harness
MPC-HSR	Redundant Power Supply Upgrade Kit for MPC12 System Consists of 2-Hot-Swap Modules, Backplane-Bracket, and Wire Harness
MPC-HSS	Replacement Single Power Supply Module
MPC-12C	Universal Chassis (chassis only)
MPC-BP	Blank Cover Plate

Operation and Controls

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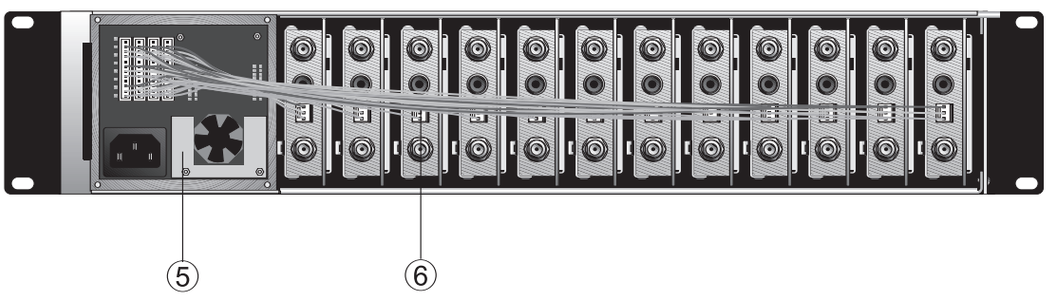
MPC-12R



Front and Rear Views

1. **MPCD:** Demodulator accepts any NTSC television signal from 54 to 806 MHz and converts it to baseband video and audio.
2. **MPCMA:** Modulators are fully agile from 54-860 MHz, including HRC and IRC offsets. The MPCMA is also adjacent channel capable.
3. **MPCM45:** Modulators are factory re-tunable within band. They provide adjacent channel capability for VHF channels 2-ZZZ, UHF channels 14-69 and cable channels 2-125, including HRC and IRC offsets.
4. **MPC-HSS Power Supply:** Hot swappable redundant power supply supplies, provides +12 Vdc and +5 Vdc to the modulators and demodulators. MPC-HSR power supply input will operate from 90 to 264 Vac.
5. **Power Supply Power Distribution Bracket:** This device provides the interface for the MPC-HSS power supplies and the MPCM45, MPCMA and MPCD modules.

6 **Power Cables:** Easily removable cables provide DC voltage from MPC-HSR power supply to the MPC-12R modules. "Home-run" configuration allows removal of modules without disabling entire system.

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MPC-12R

Installation

It is recommended that assistance be available to safely install equipment in equipment racks. Chassis must be fastened securely in equipment rack before populating with modules.

1. Install chassis in equipment rack (equipment rack sold separately) by supporting the bottom and rear of chassis at the desired elevation in rack.
2. Line up the side holes of chassis with the tapped equipment rack holes
3. Insert the provided screws through the side holes in chassis and thread into the tapped equipment rack holes.
4. Fasten the bottom screws first, then fasten top screws, tighten securely.
5. Slide power supply and equipment modules into chassis.
6. Connect power supply to all modules before supplying line power to the power supply.
7. Connect modules as described in the manual associated with module.

MODULE REPLACEMENT

1. **Power Supply:**
   - Remove power supply by sliding the unit out the front of the chassis.
   - Insert replacement power supply into chassis.
2. **Modules:**
   - Disconnect the 3 pin molex connector from module.
   - Disconnect the audio, video, and RF connectors from back of module.
   - Remove module by sliding the unit out the front of the chassis.
   - Insert replacement module into chassis.
   - Reconnect the 3 pin molex connector and audio, video, and RF connectors to the rear of module.

OPERATION AND CARE

Do's & Don'ts

- Always operate in a cool well ventilated environment.
- Always provide a stable, conditioned power source.
- Heed all safety warnings and obey all environmental and electrical operating requirements.
- To clean, use a damp cloth only and clean only with mild soap.
- Do not use solvents or harsh detergents.
- Do not use this product for purposes other than intended.

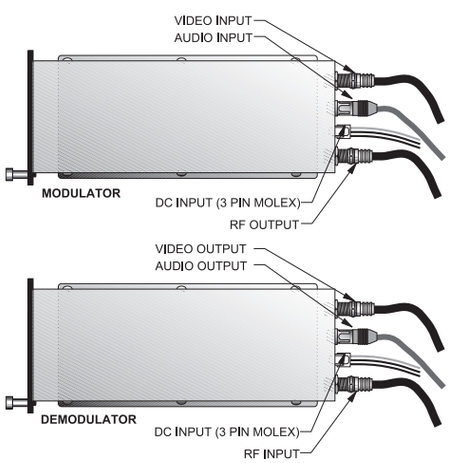
HEADEND/DISTRIBUTION INTERFACE

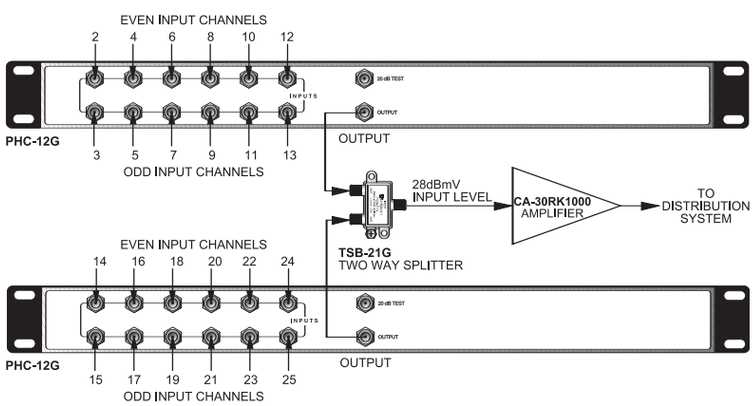
PICO MACOM recommends connecting the headend components in the following manner:

Each of the modulators, signal processors or strip amplifiers output are connected to a combining network. Either a PHC-12G or a PHC-24G headend combiner may be used to accomplish this purpose.

The PHC-12G or PHC-24G passive headend combiner consists of two rows of directional couplers combined by a hybrid splitter. Normally, the odd channels are combined on one row while even channels are combined on the other row of directional couplers for maximum isolation. The output of the combiners may be connected to the input of a launch amplifier such as a CA-30RK550 or CA-30RK1000. The output of the amplifier is connected to the main distribution line.

A 24 channel system hook-up is shown. (The same combining result may be accomplished by using a single PHC-24G). The two PHC-12G outputs are combined via a two-way splitter, which is connected to a CA-30RK1000 launch amplifier. The input levels to the combiner, whether from a modulator, signal processor or a strip amplifier, must be at the same amplitude.





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PICO MACOM®

MPC-12R

Five Year Limited Warranty*

Pico Macom, Inc. warrants to the original purchaser this product shall be free of defects in material and craftsmanship with only the limitations or exclusions set out below.

During the warranty period, Pico Macom, Inc. or an authorized Pico Macom service facility will provide, free of charge, the parts and labor necessary to correct defects in material and workmanship.

Warranty Duration

This warranty shall terminate five years* from the original date of purchase of the product or at a time the product is:

1. Misused or damaged due to neglect or improper installation.
2. Modified.
3. Repaired by someone other than the warrantor.
4. Sold by the original purchaser.

Statement of Remedy

To obtain such a warranty service, contact the salesperson where the product was obtained. You will be issued a Return Authorization (RA) number, which will be used to track your product. Be prepared to provide:

1. The model number and channel number of the product.
2. The date of purchase.
3. A specific identification of the problem.

Deliver the products to Pico Macom, Inc. or ship the products in the original packing material at the address at the bottom of the page. Include satisfactory evidence of the date of purchase.

Products will not be accepted by Pico Macom, Inc. without the RA number clearly indicated on the shipping label.

The foregoing constitutes the Pico Macom, Inc. entire obligation with respect to this product and the original purchaser and any user or owner shall have ***no other remedy and no claim for incidental or consequential damages. Some states do not allow limitations on how long an implied warranty lasts or do not allow the exclusions or limitation of incidental or consequential damages, so the above limitation and exclusion may or may not apply to you.***

This warranty gives you specific legal rights, and you also have rights, that vary from state to state. (U.S.A.)

* One year warranty if sold outside U.S.A.

Pico Macom, Inc.
6260 Sequence Drive
San Diego, CA 92121

PICO MACOM
INDUSTRY LEADING 5 YEAR WARRANTY